IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

1-9. (Canceled).

10. (Currently Amended) A base station apparatus that performs radio communication with a plurality of mobile station apparatuses concurrently, the base station apparatus comprising:

a plurality of antennas provided in a greater number than the plurality of mobile station apparatuses;

a receiver that receives a plurality of signals from the plurality of mobile station apparatuses via the plurality of antennas;

an estimator that estimates channel estimation values between the plurality of mobile station apparatuses and the plurality of antennas using the plurality of signals;

a transformer that performs linear transformation of a plurality of transmission signals using coefficients determined from the channel estimation values estimated in the estimator; and

a transmitter that transmits the plurality of transmission signals subjected to linear transformation to the plurality of

mobile station apparatuses via the plurality of antennas, wherein:

the transformer performs linear transformation of the plurality of transmission signals in accordance with the formula:

~~$[|Sig_{out}|_{Nx1} = |x|_{NxM} \cdot |Sig_{in}|_{Nx1}]$~~

$|Sig_{out}|_{Mx1} = |x|_{NxM} \cdot |Sig_{in}|_{Nx1}$

where:

N is the number of the plurality of mobile station apparatuses and M is the number of the plurality of antennas;

~~$[|Sig_{out}|_{Nx1}]$~~ $|Sig_{out}|_{Mx1}$ is a matrix of the plurality of transmission signals subjected to linear transformation in the transformer;

$|x|_{NxM}$ is a matrix of the coefficients; and

$|Sig_{in}|_{Nx1}$ is a matrix of the plurality of transmission signals before linear transformation in the transformer.

11. (Canceled).

12. (Previously Presented) The base station apparatus of claim 10, wherein the transformer performs linear transformation of the plurality of transmission signals so that interference is cancelled from the plurality of transmission signals upon reception at the plurality of mobile station apparatuses.

13. (Previously Presented) The base station apparatus of claim 10, wherein the transformer performs linear transformation of the plurality of transmission signals so that influence of delay waves is removed from the plurality of transmission signals upon reception at the plurality of mobile station apparatuses.

14. (Previously Presented) The base station apparatus of claim 10, further comprising a coefficient calculator that calculates the coefficients used in the transformer through inverse matrix operation using the channel estimation values estimated in the estimator.

15. (Previously Presented) The base station apparatus of claim 14, further comprising a selector that selects the same number of antennas as the plurality of mobile station apparatuses from the plurality of antennas for use in the inverse matrix operation.

16. (Previously Presented) The base station apparatus of claim 10, further comprising a trainer that determines the coefficients used in the transformer through training processing using the channel estimation values estimated in the estimator.

17. (Previously Presented) The base station apparatus of claim 16, further comprising a generator that generates noise having an equivalent level as an anticipated level of noise at the plurality of mobile station apparatuses, wherein the trainer incorporates the noise generated in the generator in the training processing.

18. (Previously Presented) The base station apparatus of claim 16, further comprising a selector that selects the same number of antennas as the plurality of mobile station apparatuses from the plurality of antennas for use in the training processing.